

REMARKS

Claims 1-6 and 9 are pending.

Claims 1-5 are rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of JP2-49556 and Hester, et al.

Claim 6 is rejected under 35 U.S.C. §103(a) as being unpatentable over any one of JP01 117755, Matsuura and JP2-49556.

Claims 1-5 and 9 are rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Matsuura and Hester, et al.

Claim 1 is the sole independent claim from which each of the other claims directly depends.

The present invention as recited in claims 1-6 and 9 is directed to a method of a grinding step (A) in which raw soybeans are ground to provide a soybean slurry, and a heating step (B) in which the provided soybean slurry is heated and thermally denatured. As set forth in main claim 1:

1. in the heating step (B), the soybean slurry flows alternately between a large diameter pipe arranged in a straight line and a small diameter pipe bent in a turning configuration; and
2. partway through the heating step (B) a deaeration step (C) for removing air bubbles mixed in with the soybean slurry is performed.

The Examiner recognizes that although the above feature 1.:

in the heating step (B), the soybean slurry is flowed alternately between a large diameter pipe arranged in a straight line and a small diameter pipe bent in a turning configuration;

is not disclosed in either of the primary references JP2-49556 or Matsuura, he considers the concept of this feature to be disclosed in Hester, and takes the position that the feature would have been obvious to one having ordinary skill in the art at the time of the invention, based on the description of Hester.

Further, the Examiner has asserted that feature 2.:

partway through the heating step (B) a deaeration step (C) for removing air bubbles mixed in with the soybean slurry is performed

would have been obvious to one having ordinary skill in the art at the time.

Applicants respectfully contend that the positions taken by the Examiner are incorrect and the reasons therefore are explained in the following.

In Hester, the following is described at column 24, lines 41-50:

Mixing element can, therefore, be employed to replace long sections of smaller diameter pipe, used to effect higher flow rates and greater turbulence at any given mass throughput, with relatively less expensive shorter sections of larger diameter pipe. Although depicted with mixing elements, it will be appreciated by those skilled in the art that a reduction of the reaction zone cross-sectional area can produce higher reaction mass flow velocities to thereby effect greater turbulence and negate the need for mixing element.

The description of Hester relates to a device having a pipe containing one or more mixing elements inside the pipe (see for example, U.S. 5,520,460 of Koch Engineering Company).

Hester basically discloses that mixing elements can be employed in which long sections of small diameter pipe are replaced with relatively less expensive shorter sections of larger diameter pipe. Hester neither teaches nor suggests the technical concept set forth in main claim 1 that the product flows through a piping in which there are alternately arranged large diameter pipes and small diameter pipes bent in a turning configuration. Hester merely discloses that shorter sections of larger diameter pipe when used for mixing can exhibit similar effects to the more expensive long sections of smaller diameter pipe.

Hester does not disclose the alternate flowing of a mixture between a small diameter pipe section bent in a turning configuration and a straight pipe of a larger diameter.

According to the present invention, by having the product flow alternately through the small diameter pipe bent in a turning configuration and the straight pipe of

larger diameter, unexpected and advantageous effects are exhibited as described in the present invention. The distinctive effects exhibited include “by making the diameter of the pipes smaller in the locations where the pipes through which the soybean slurry circulates are made to turn, the flow speed of the circulating soybean slurry changes and an ideal mixing state is achieved in which the soybean slurry is thoroughly agitated. Therefore, the characteristic effect is obtained that the protein component contained in the circulating soybean slurry is uniformly mixed” (see page 17, lines 8-15 of this Specification). That is, the method of claim 1 achieves a uniform mixing of a soybean slurry. This goal of the invention and the process for achieving it is neither taught nor suggested by Hester.

As described above, Hester does not at all lead a person of ordinary skill to the claimed feature of “in the heating step (B), the soybean slurry is flowed alternately between a large diameter pipe arranged in a straight line and a small diameter pipe bent in a turning configuration;”.

Moreover, Hester discloses a technique relating to a device in which mixing elements are provided inside of a pipe, and describes with respect to the mixing elements that:

any so-called plug-flow reactor design can be used as part of the instant invention. In addition to better mixing, the use of mixing elements may provide for better heat transfer into the reaction mass at lower flow rates, especially when heat is transferred through the walls of the reaction zone, such as would be the case when utilizing a heating jacket around the reaction zone. [Column 24, lines 53-39]

This description recommends providing mixing elements inside of a pipe. It indicates an opposite view on the use of a pipe without internal mixing elements as disclosed and claimed in the present invention. That is, the present invention is characterized by letting the product flow alternately between a large diameter pipe arranged in a straight line and a small diameter pipe bent in a turning configuration. Hester recommends providing mixing elements inside of a pipe.

There is no logical basis to combine Hester's structure with any of the structures of JP2-49556, JP01 117755 or Matsuura since none of these have a mixer within a pipe. Accordingly, it is inappropriate that Hester's structure which basically is directed to a heat-transfer technique, would motivate one to use it in combination with either JP2-49556, JP01 117755 or Matsuura.

Further, even if the combination is improperly made, it does not teach or suggest the novel subject matter of main claim 1. As described above, Hester merely discloses a technique in which products are stirred by mixing elements. He neither discloses nor even suggests the technical concept of the present invention in which the soybean product flows alternately between a large diameter pipe arranged in a straight line and a small diameter pipe bent in a turning configuration. Also, Hester does not describe a structure that produces the advantageous effects of the present invention.

Accordingly, claim 1 defines novel and advantageous subject matter that patentably defines over the cited art. Claims 2-5 and 9 depend from main claim 1 and recite further novel features of the invention. Accordingly, claims 1-5 and 9 are patentable over the cited art and should be allowed.

Claim 6 depends from claim 1 and recites a further novel feature of the invention. The additional cited reference to JP01-117755 taken alone or in combination with the other references applied in combination against claim 1, or taking said references alone, still does not teach the novel subject matter of claim 1. Therefore, claim 6 also is patentable and should be allowed.

The amendment should be entered since it clearly demonstrates the allowability of all of the claims in the application. It raises no new issues since no amendments are made to the claims. It is requested that the Examiner fairly and accurately reconsider the claims based on the comments presented above and allow them.

If the response is not entered as placing the application in condition for allowance, then its entry into the record for purposes of appeal is respectfully requested.

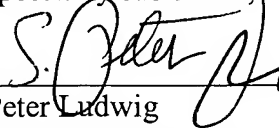
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Prompt and favorable action is requested.

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